Radiation Injury Treatment Network®: Shared Resources for Rad/Nuke Disaster Preparedness

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Radiological disaster preparedness a tale of two cities......

Disaster Effected Community & Distant Receiving Community
Katrina’s Diaspora

The victims of Hurricane Katrina have filed for assistance from FEMA from every state. The map shows the distribution and number of the 1.36 million individual assistance applications as of Sept. 23.
Leveraging transplant community capabilities for preparedness

Partnered with ASBMT from beginning it is the pre-imminent association scholars and clinicians in transplantation

Established network and experience with coordinating transplants

Volunteer Marrow Donors

- 16,000,000 International
- 13,000,000 US (on Be The Match/NMDP Registry)

Cord Blood Units

- 474,000 International
- 238,000 US (on Be The Match/NMDP Registry)

2016: YEAR AT A GLANCE

- 6,200 patients received a marrow transplant, 80,000 since 1987
What is RITN? & Why Cancer Centers

- RITN is focused on the care of ARS patients in cities distant from the disaster
- RITN = Hematology/Oncology/Bone Marrow Transplant medical professionals
- RITN receives ARS patients through NDMS

For list go to RITN.net/about

Year: 2006
RITN Preparedness Efforts…. Exercises, Training and More…. Since 2006

725 exercises
***All exercise materials available on RITN.net

16,450 medical staff trained
***Free web-based courses available on RITN.net

18,400 dose of G-CSF, Peg G-CSF & GM-CSF on-hand
***Fluctuates throughout year, is sum of inventory at each RITN hospital

2,160 adult & 875 pediatric ARS inpatient beds w/in 24 hrs
2,825 adult & 1,130 pediatric ARS outpatient beds w/in 24 hrs

73 hospitals and cancer centers
Treatment Guidelines on RITN.net/treatment

Acute Radiation Syndrome Treatment Guidelines

**Decision to perform HLA typing**

Factors favoring HLA typing:
- Estimated whole body dose > 3 Gy
- Neutrophil count < 100/μl by day 6 (see slide 26)
- Rapid drop of platelets (see slide 27)
- Expected to survive other injuries

Expedited HLA typing will be available using buccal swab, with high resolution DNA typing of HLA-A, -B, -C, -DRB1, and -DQB1

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**Radiation Injury Treatment Network Acute Radiation Syndrome Treatment Guidelines**

Contents

- Principles of ARS management at RITN centers
- Altered standards after a nuclear detonation
- Acute Radiation Syndrome
- Casualty triage after a nuclear detonation
- ARS management
- Stem cell support: when to HLA type casualties
- Additional Resources

**Decision to recruit a donor for evaluation**

Factors favoring recruitment of a donor:
- Bone marrow is aplastic at 2 sites >14 days after exposure
- Neutrophil count < 100/μl after 5 days of myeloid cytokine therapy
- Expected to survive other injuries
- Suitable donor is available:
  - 8/8 match (HLA-A, B, C, DRB1) using bone marrow or PBSCs
  - Alternatives, if a matched donor is unavailable:
    - At least 6/6 matched umbilical cord blood of adequate cell number
    - Histocompatible donor
    - Mixmatched, related or unrelated donor with T-cell depletion

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*Guidance for obtaining HLA typing can be obtained by contacting the NMDP or the closest RITN center:
-NMDP HLA-typing guidance: 1 (800) IMMARROW or (612) 627-5800
-For an updated map and list of RITN centers: [http://www.ritn.net/About/](http://www.ritn.net/About/)
-[RITN Participating Centers General Contact Directory: http://www.ritn.net/Contact/](http://www.ritn.net/Contact/)

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RITN

www.RITN.net
Referral Guidelines: www.RITN.net/treatment

Guidelines for Identifying Radiation Injury and Considering Transfer to a Specialized Facility

Purpose: to provide hospitals with a concise guide for identifying casualties in the aftermath of a radiation incident who may have received a clinically significant dose of radiation.

Regional RITN hospital contact information for specialized consultation:

Hospital Name:
Department:
Phone:
E-mail:

Overview: Ionizing radiation affects the hematopoietic system even at very low doses; hematology and oncology medical staff treat these effects daily. Irradiated patients may develop severe organ dysfunction over time and require intense and specialized management.

For extensive information on the acute radiation syndrome (hematologic, gastrointestinal, cutaneous, central nervous system), types of radiation incidents, and radiation decontamination, see: www.remm.nlm.gov (Radiation Emergency Medical Management (REMM) website)

CONSULTATION/REFERRAL CRITERIA: Any patient suspected of having a radiation injury can be discussed with your local RITN center. The ability to accept referrals will depend on the size of the incident and the capacity of regional RITN center(s).

a. Criteria for considering RITN center consultation/referral include:
   i. Absolute neutrophil count less than 1,000/µL
   ii. Absolute lymphocyte count less than 1,000/µL
   iii. Severe nausea, vomiting and/or anorexia
   iv. A localized cutaneous radiation injury that requires extensive management
   v. Suspected or known internal contamination (e.g. involving a wound, the lung or GI tract)
   vi. Current facility not equipped to provide irradiated, leukoreduced blood products

b. Manage comorbidities and possible sequelae of irradiation:
   i. See www.ritn.net/treatment/ for acute radiation syndrome treatment guidelines:
Prototype for Adult Medical Orders During a Radiation Incident
Version: April 17, 2017

Cautions
• Authored by REMM and RITN physicians, this set of orders is a prototype only.
• Orders must be customized for each patient and incident.
• Specific drugs are suggested for function only. Patients may not need any/ever
category of drug listed.
• No HHS, CDC, FDA, or other US government entity endorsement of specific
drugs or drug doses is intended or implied by inclusion in this order set.
• Consult the notes at the end of this document for additional, key information.

Internal contamination (decontamination treatments)
• This Adult Orders Prototype lists only FDA-approved medications as radiisotope
countermeasures.
• Some, but not all of these drugs are currently in the Strategic National Stockpile.
• Prescribers should consult the FDA drug label for complete prescribing information.
• Decoeration drugs should be used in children with great caution.
• The online version of REMM has additional recommendations about additional
countermeasure drugs that may be considered.
• This prototype does not address threshold levels of internal contamination that
would trigger initiation, continuation, or discontinuation of decontamination
treatment. See REMM Countermeasures Caution and Comment, which discusses
this issue

Drug dosages
• All adult drug doses in this prototype are based on a 70 kg adult with normal renal
and hepatic function.
• Appropriate dose adjustments should be made based on age, weight, drug-drug
interactions, nutritional status, renal, and hepatic function.

• After a mass casualty incident, practitioners may encounter counterfeit drugs. This

Prototype for Pediatric Medical Orders During a Radiation Incident
Version: April 17, 2017

Cautions
• Authored by REMM and RITN physicians, this set of orders is a prototype only.
• Orders must be customized for each patient and incident.
• Specific drugs are suggested for function only. Patients may not need any/ever
category of drug listed.
• No HHS, CDC, FDA, or other US government entity endorsement of specific
drugs or drug doses is intended or implied by inclusion in this order set.
• Consult the notes at the end of this document for additional, key information.

Internal contamination (decontamination treatments)
• This Pediatric Orders Prototype lists only FDA-approved medications as radiisotope countermeasures.
• Some, but not all of these drugs are currently in the Strategic National Stockpile.
• Prescribers should consult the FDA drug label for complete prescribing information.
• Decoeration drugs should be used in children with great caution.
• The online version of REMM has additional recommendations about additional
countermeasure drugs that may be considered.
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Training: Medical Grand Rounds on RITN.net/training

Medical Grandrounds: Medical Response to Radiation Exposure: the Role of Hematologists

Rev. March 2016

Agenda

- Radiation Injury Treatment Network
- Radiological Event Scenarios
- Radiation Biology
- Dosimetry
- Acute Radiation Syndrome
- Mitigation and Treatment
- Available resources
Web Based Training on RITN.net/training (FREE TRAINING)

- Web based training
  - Intro to RITN
  - Basic Radiation Training
  - RITN Concept of Operations
  - Radiation Safety Communication
  - GETS Card 101
  - Satellite Telephone 101
  - Non-Medical Radiation Awareness Training (ESL)

- Medical Grand Rounds training

Adopted by NNSA for USAID training
Exercise Materials on RITN.net/exercises

- SITMANs & AARs
  - Tabletops, full scale and functional exercises
  - 12 years of exercise materials
RITN YouTube Channel

- RITN What You Need to Know (<Video>): 4 min overview video

- Exercise videos
Background on NMDP and CIBMTR Data Collection

National Marrow Donor Program, a Program Contractor

The National Marrow Donor Program® (NMDP), also known as Be The Match®, holds three of the contracts for the C.W. Bill Young Cell Transplantation Program (the Program):

- Office of Patient Advocacy/Single Point of Access
- Bone Marrow Coordinating Center
- Cord Blood Coordinating Center

The NMDP has operated under Federal contract beginning in 1987 through the National Bone Marrow Donor Registry (NBMDR), and since September 2006 through the Program.

Research, Data, & Outcomes

Improving the lives of patients by collecting medical data, doing more research, and exploring new ideas.

The C.W. Bill Young Cell Transplantation Program (Program) helps patients who need a potentially life-saving bone marrow or umbilical cord blood transplant. One part of this Program focuses on the behind-the-scenes details that are critical to helping patients:

- Collecting and analyzing data about patients who have received a transplant
- Bringing together doctors, medical experts and scientists to discuss new transplant-related ideas
- Examining the best ideas through research studies

A bone marrow or cord blood transplant replaces diseased blood-forming cells with healthy cells. When a person has a life-threatening disease, such as leukemia, lymphoma, or an inherited metabolic or immune

- Transplant Outcomes and Data—Read reports and view graphs about patient outcomes and the numbers of transplants performed.
- Registry Data—View annual information about potential donors and donated cord blood units on the donor registry of the C.W. Bill Young Cell Transplantation Program, also called the Be The Match Registry®.
- Cord Blood Units for Research—Researchers can find a listing of cord blood banks that provide cord blood units for pre-clinical and clinical research.
Data Collection

• Since 2006 have maintained Marrow Toxic injury consent protocols and forms for patients treated at RITN hospital
• These are approved locally by each hospital's Institution Review Board
• Released web-based data collection forms in 2015
Data Collection

- These are research forms
- Not for real-time
- Baseline form is 263 questions (11 pages)
- Forms are accessed through web based system
- Data managers at hospitals enter data
- Follow-up form is collected at 100 days, 180 days and annually for life
Baseline Form Sections

- Demographics
- Co-Morbid Conditions
- Radiation Exposure Information
- Patient Trauma and Illness
- Organ Function
- Complete Blood Count (CBC)
- Lymphocyte Analysis
- Therapy and Infection Prophylaxis
If you do one thing following this presentation

Download the REMM phone App

or the entire site to your computer

www.REMM.NLM.gov